

# SEQUENCE LISTING

<110> Edens, Luppo  
Lopez, Michel

<120> Improved method for the prevention or reduction of haze in  
beverages

<130> 246152024400

<140> US 10/517,220

<141> 2003-05-14

<150> PCT/NL03/00352

<151> 2003-05-14

<150> NL 02100681.2

<151> 2002-06-07

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<170> PatentIn Ver. 2.1

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| Ser | Arg | Pro | Ala | Ser | Ser | Lys | Ser | Ala | Ala | Thr | Thr | Gly | Glu | Ala | Tyr |
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| Phe | Glu | Gln | Leu | Leu | Asp | His | His | Asn | Pro | Glu | Lys | Gly | Thr | Phe | Ser |
|     | 50  |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |     |
| Gln | Arg | Tyr | Trp | Trp | Ser | Thr | Glu | Tyr | Trp | Gly | Gly | Pro | Gly | Ser | Pro |
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| Val | Val | Leu | Phe | Asn | Pro | Gly | Glu | Val | Ser | Ala | Asp | Gly | Tyr | Glu | Gly |
|     |     |     |     | 85  |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Tyr | Leu | Thr | Asn | Asp | Thr | Leu | Thr | Gly | Val | Tyr | Ala | Gln | Glu | Ile | Gln |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Gly | Ala | Val | Ile | Leu | Ile | Glu | His | Arg | Tyr | Trp | Gly | Asp | Ser | Ser | Pro |
|     |     | 115 |     |     |     | 120 |     |     |     |     |     | 125 |     |     |     |
| Tyr | Glu | Val | Leu | Asn | Ala | Glu | Thr | Leu | Gln | Tyr | Leu | Thr | Leu | Asp | Gln |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
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| Asp | Asn | Ser | Ser | Arg | Ser | Asn | Ala | Gln | Asn | Ala | Pro | Trp | Val | Met | Val |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Gly | Gly | Ser | Tyr | Ser | Gly | Ala | Leu | Thr | Ala | Trp | Thr | Glu | Ser | Ile | Ala |
|     |     | 180 |     |     |     |     | 185 |     |     |     |     |     | 190 |     |     |
| Pro | Gly | Thr | Phe | Trp | Ala | Tyr | His | Ala | Thr | Ser | Ala | Pro | Val | Glu | Ala |
|     |     | 195 |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |
| Ile | Tyr | Asp | Phe | Trp | Gln | Tyr | Phe | Tyr | Pro | Ile | Gln | Gln | Gly | Met | Ala |
|     | 210 |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     |
| Gln | Asn | Cys | Ser | Lys | Asp | Val | Ser | Leu | Val | Ala | Glu | Tyr | Val | Asp | Lys |
| 225 |     |     |     | 230 |     |     |     |     |     | 235 |     |     |     | 240 |     |
| Ile | Gly | Lys | Asn | Gly | Thr | Ala | Lys | Glu | Gln | Glu | Leu | Lys | Glu | Leu |     |
|     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |     |
| Phe | Gly | Leu | Gly | Ala | Val | Glu | His | Tyr | Asp | Asp | Phe | Ala | Ala | Val | Leu |
|     |     | 260 |     |     |     | 265 |     |     |     |     |     |     | 270 |     |     |
| Pro | Asn | Gly | Pro | Tyr | Leu | Trp | Gln | Asp | Asn | Asp | Phe | Val | Thr | Gly | Tyr |
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|     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |     |
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|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |
| Ala | Ser | Tyr | Gly | Tyr | Trp | Thr | Asp | Glu | Trp | Ser | Val | Ala | Cys | Phe |
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|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |
| Pro | Val | Asp | Arg | Gln | Trp | Glu | Trp | Phe | Leu | Cys | Asn | Glu | Pro | Phe |
|     |     | 370 |     |     |     | 375 |     |     |     |     |     | 380 |     |     |
| Trp | Trp | Gln | Asp | Gly | Ala | Pro | Glu | Gly | Thr | Ser | Thr | Ile | Val | Pro |
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| Glu | Val | Asn | Gly | Tyr | Thr | Tyr | Gly | Ser | Ala | Lys | Gly | Lys | Asn | Ser |
|     |     | 420 |     |     |     |     |     | 425 |     |     |     |     | 430 |     |
| Thr | Val | Asn | Ser | Trp | Thr | Gly | Gly | Trp | Asp | Met | Thr | Arg | Asn | Thr |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |
| Arg | Leu | Ile | Trp | Thr | Asn | Gly | Gln | Tyr | Asp | Pro | Trp | Arg | Asp | Ser |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |
| Val | Ser | Ser | Thr | Phe | Arg | Pro | Gly | Gly | Pro | Leu | Val | Ser | Thr | Ala |
| 465 |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Glu | Pro | Val | Gln | Ile | Ile | Pro | Gly | Gly | Phe | His | Cys | Ser | Asp | Leu |
|     |     |     | 485 |     |     |     |     |     | 490 |     |     |     |     | 495 |
| Met | Glu | Asp | Tyr | Tyr | Ala | Asn | Glu | Gly | Val | Arg | Lys | Val | Val | Asp |
|     |     | 500 |     |     |     |     | 505 |     |     |     |     |     | 510 |     |
| Glu | Val | Lys | Gln | Ile | Lys | Glu | Trp | Val | Glu | Glu | Tyr | Tyr | Ala |     |
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| Met | Arg | Ala | Phe | Ser | Ala | Val | Ala | Ala | Ala | Ala | Leu | Ala | Leu | Ser | Trp |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ala | Ser | Leu | Ala | Gln | Ala | Ala | Arg | Pro | Arg | Leu | Val | Pro | Lys | Pro | Val |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ser | Arg | Pro | Ala | Ser | Ser | Lys | Ser | Ala | Ala | Thr | Thr | Gly | Glu | Ala | Tyr |
|     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |     |     |     |
| Phe | Glu | Gln | Leu | Leu | Asp | His | His | Asn | Pro | Glu | Lys | Gly | Thr | Phe | Ser |
|     | 50  |     |     |     | 55  |     |     |     |     |     | 60  |     |     |     |     |
| Gln | Arg | Tyr | Trp | Trp | Ser | Thr | Glu | Tyr | Trp | Gly | Gly | Pro | Gly | Ser | Pro |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Val | Val | Leu | Phe | Thr | Pro | Gly | Glu | Val | Ser | Ala | Asp | Gly | Tyr | Glu | Gly |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Tyr | Leu | Thr | Asn | Gly | Thr | Leu | Thr | Gly | Val | Tyr | Ala | Gln | Glu | Ile | Gln |
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| Gly | Ala | Val | Ile | Leu | Ile | Glu | His | Arg | Tyr | Trp | Gly | Asp | Ser | Ser | Pro |
|     | 115 |     |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Tyr | Glu | Val | Leu | Asn | Ala | Glu | Thr | Leu | Gln | Tyr | Leu | Thr | Leu | Asp | Gln |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Ala | Ile | Leu | Asp | Met | Thr | Tyr | Phe | Ala | Glu | Thr | Val | Lys | Leu | Gln | Phe |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Asp | Asn | Ser | Thr | Arg | Ser | Asn | Ala | Gln | Asn | Ala | Pro | Trp | Val | Met | Val |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Gly | Ser | Tyr | Ser | Gly | Ala | Leu | Thr | Ala | Trp | Thr | Glu | Ser | Val | Ala |
|     |     | 180 |     |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Pro | Gly | Thr | Phe | Trp | Ala | Tyr | His | Ala | Thr | Ser | Ala | Pro | Val | Glu | Ala |
|     | 195 |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |
| Ile | Tyr | Asp | Tyr | Trp | Gln | Tyr | Phe | Tyr | Pro | Ile | Gln | Gln | Gly | Met | Ala |

|                         |                     |                     |     |     |
|-------------------------|---------------------|---------------------|-----|-----|
| 210                     |                     | 215                 |     | 220 |
| Gln Asn Cys Ser Lys Asp | Val Ser Leu Val Ala | Glu Tyr Val Asp Lys |     |     |
| 225                     | 230                 | 235                 | 240 |     |
| Ile Gly Lys Asn Gly Thr | Ala Lys Glu Gln Gln | Ala Leu Lys Glu Leu |     |     |
|                         | 245                 | 250                 | 255 |     |
| Phe Gly Leu Gly Ala Val | Glu His Phe Asp Asp | Phe Ala Ala Val Leu |     |     |
|                         | 260                 | 265                 | 270 |     |
| Pro Asn Gly Pro Tyr Leu | Trp Gln Asp Asn Asp | Phe Ala Thr Gly Tyr |     |     |
|                         | 275                 | 280                 | 285 |     |
| Ser Ser Phe Phe Gln Phe | Cys Asp Ala Val Glu | Gly Val Glu Ala Gly |     |     |
|                         | 290                 | 295                 | 300 |     |
| Ala Ala Val Thr Pro Gly | Pro Glu Gly Val Gly | Leu Glu Lys Ala Leu |     |     |
| 305                     | 310                 | 315                 | 320 |     |
| Ala Asn Tyr Ala Asn Trp | Phe Asn Ser Thr Ile | Leu Pro Asp Tyr Cys |     |     |
|                         | 325                 | 330                 | 335 |     |
| Ala Ser Tyr Gly Tyr Trp | Thr Asp Glu Trp Ser | Val Ala Cys Phe Asp |     |     |
|                         | 340                 | 345                 | 350 |     |
| Ser Tyr Asn Ala Ser Ser | Pro Ile Tyr Thr Asp | Thr Ser Val Gly Asn |     |     |
|                         | 355                 | 360                 | 365 |     |
| Ala Val Asp Arg Gln Trp | Glu Trp Phe Leu Cys | Asn Glu Pro Phe Phe |     |     |
|                         | 370                 | 375                 | 380 |     |
| Tyr Trp Gln Asp Gly Ala | Pro Glu Gly Thr Ser | Thr Ile Val Pro Arg |     |     |
| 385                     | 390                 | 395                 | 400 |     |
| Leu Val Ser Ala Ser Tyr | Trp Gln Arg Gln Cys | Pro Leu Tyr Phe Pro |     |     |
|                         | 405                 | 410                 | 415 |     |
| Glu Thr Asn Gly Tyr Thr | Tyr Gly Ser Ala Lys | Gly Lys Asn Ala Ala |     |     |
|                         | 420                 | 425                 | 430 |     |
| Thr Val Asn Ser Trp Thr | Gly Gly Trp Asp Met | Thr Arg Asn Thr Thr |     |     |
|                         | 435                 | 440                 | 445 |     |
| Arg Leu Ile Trp Thr Asn | Gly Gln Tyr Asp Pro | Trp Arg Asp Ser Gly |     |     |
|                         | 450                 | 455                 | 460 |     |
| Val Ser Ser Thr Phe Arg | Pro Gly Gly Pro Leu | Ala Ser Thr Ala Asn |     |     |
| 465                     | 470                 | 475                 | 480 |     |
| Glu Pro Val Gln Ile Ile | Pro Gly Gly Phe His | Cys Ser Asp Leu Tyr |     |     |
|                         | 485                 | 490                 | 495 |     |
| Met Ala Asp Tyr Tyr Ala | Asn Glu Gly Val Lys | Lys Val Val Asp Asn |     |     |
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Arg | Ser | Phe | Ser | Val | Val | Ala | Ala | Ala | Ser | Leu | Ala | Leu | Ser | Trp |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Ala | Ser | Leu | Ala | Gln | Ala | Ala | Arg | Pro | Arg | Leu | Val | Pro | Lys | Pro | Ile |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Ser | Arg | Pro | Ala | Ser | Ser | Lys | Ser | Ala | Ala | Thr | Thr | Gly | Glu | Ala | Tyr |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Phe | Glu | Gln | Leu | Leu | Asp | His | His | Asn | Pro | Glu | Lys | Gly | Thr | Phe | Ser |
|     | 50  |     |     |     |     | 55  |     |     |     | 60  |     |     |     |     |     |
| Gln | Arg | Tyr | Trp | Trp | Ser | Thr | Glu | Tyr | Trp | Gly | Gly | Pro | Gly | Ser | Pro |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Val | Val | Leu | Phe | Asn | Pro | Gly | Glu | Val | Ser | Ala | Asp | Gly | Tyr | Glu | Gly |
|     |     |     |     | 85  |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Tyr | Leu | Thr | Asn | Asp | Thr | Leu | Thr | Gly | Val | Tyr | Ala | Gln | Glu | Ile | Gln |
|     |     |     | 100 |     |     |     | 105 |     |     |     |     | 110 |     |     |     |
| Gly | Ala | Val | Ile | Leu | Ile | Glu | His | Arg | Tyr | Trp | Gly | Asp | Ser | Ser | Pro |
|     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |
| Tyr | Glu | Val | Leu | Asn | Ala | Glu | Thr | Leu | Gln | Tyr | Leu | Thr | Leu | Asp | Gln |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ile | Leu | Asp | Met | Thr | Tyr | Phe | Ala | Glu | Thr | Val | Lys | Leu | Gln | Phe |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Asp | Asn | Ser | Ser | Arg | Ser | Asn | Ala | Gln | Asn | Ala | Pro | Trp | Val | Met | Val |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Gly | Gly | Ser | Tyr | Ser | Gly | Ala | Leu | Thr | Ala | Trp | Thr | Glu | Ser | Ile | Ala |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Pro | Gly | Thr | Phe | Trp | Ala | Tyr | His | Ala | Thr | Ser | Ala | Pro | Val | Glu | Ala |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ile | Tyr | Asp | Phe | Gln | Gly | Met | Ala | Gln | Asn | Cys | Ser | Lys | Asp | Val | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Leu | Val | Ala | Glu | Tyr | Val | Asp | Lys | Ile | Gly | Lys | Asn | Gly | Thr | Ala | Lys |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Glu | Gln | Gln | Glu | Leu | Lys | Glu | Leu | Phe | Gly | Leu | Gly | Ala | Val | Glu | His |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Tyr | Asp | Asp | Phe | Ala | Ala | Val | Leu | Pro | Asn | Gly | Pro | Tyr | Leu | Trp | Gln |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |
| Asp | Asn | Asp | Phe | Val | Thr | Gly | Tyr | Ser | Ser | Phe | Phe | Gln | Phe | Cys | Asp |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |
| Ala | Val | Glu | Gly | Val | Glu | Ala | Gly | Ala | Ala | Val | Thr | Pro | Gly | Pro | Glu |
|     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |
| Gly | Val | Gly | Leu | Glu | Lys | Ala | Leu | Ala | Asn | Tyr | Ala | Asn | Trp | Phe | Asn |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |
| Ser | Thr | Ile | Leu | Pro | Asn | Tyr | Cys | Ala | Ser | Tyr | Gly | Tyr | Trp | Thr | Asp |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |
| Glu | Trp | Ser | Val | Ala | Cys | Phe | Asp | Ser | Tyr | Asn | Ala | Ser | Ser | Pro | Ile |
|     |     | 340 |     |     |     |     |     | 345 |     |     |     |     | 350 |     |     |
| Phe | Thr | Asp | Thr | Ser | Val | Gly | Asn | Pro | Val | Asp | Arg | Gln | Trp | Glu | Trp |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |
| Phe | Leu | Cys | Asn | Glu | Pro | Phe | Phe | Trp | Trp | Gln | Asp | Gly | Ala | Pro | Glu |
|     | 370 |     |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |
| Gly | Thr | Ser | Thr | Ile | Val | Pro | Arg | Leu | Val | Ser | Ala | Ser | Tyr | Trp | Gln |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |
| Arg | Gln | Cys | Pro | Leu | Tyr | Phe | Pro | Glu | Val | Asn | Gly | Tyr | Thr | Tyr | Gly |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |
| Ser | Ala | Lys | Gly | Lys | Asn | Ser | Ala | Thr | Val | Asn | Ser | Trp | Thr | Gly | Gly |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |
| Trp | Asp | Met | Thr | Arg | Asn | Thr | Thr | Arg | Leu | Ile | Trp | Thr | Asn | Gly | Gln |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |
| Tyr | Asp | Pro | Trp | Arg | Asp | Ser | Gly | Val | Ser | Ser | Thr | Phe | Arg | Pro | Gly |
|     | 450 |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |
| Gly | Pro | Leu | Val | Ser | Thr | Ala | Asn | Glu | Pro | Val | Gln | Ile | Ile | Pro | Gly |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Gly | Phe | His | Cys | Ser | Asp | Leu | Tyr | Met | Glu | Asp | Tyr | Tyr | Ala | Asn | Glu |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |
| Gly | Val | Arg | Lys | Val | Val | Asp | Asn | Glu | Val | Lys | Gln | Ile | Lys | Glu | Tyr |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |
| Gly | Tyr | Gly | Cys |     |     |     |     |     |     |     |     |     |     |     |     |
|     |     |     | 515 |     |     |     |     |     |     |     |     |     |     |     |     |